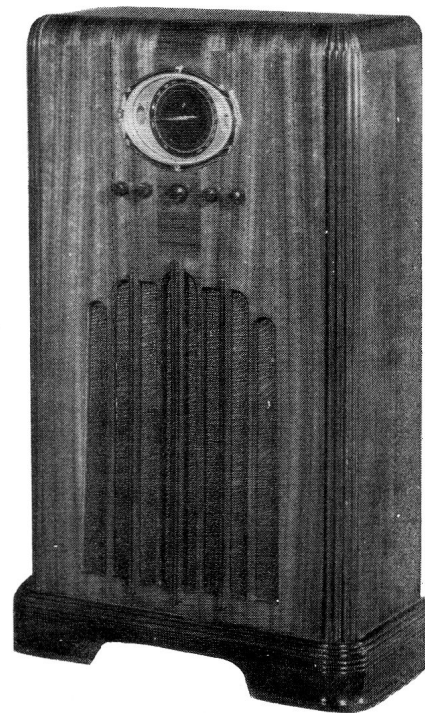
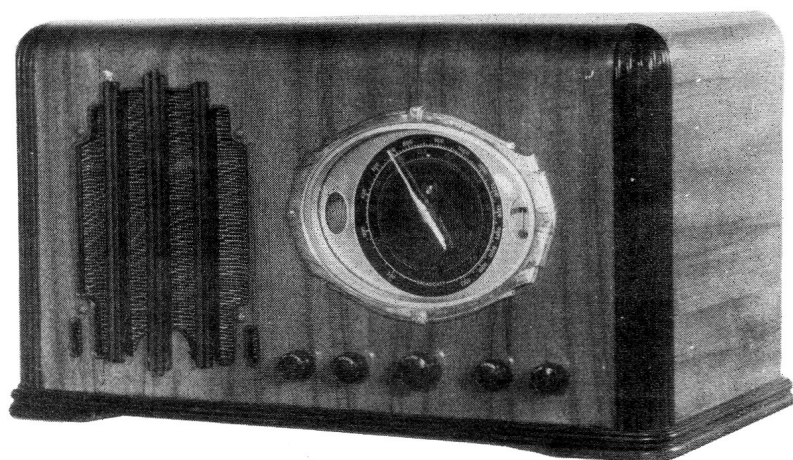


# Models 620, 620A, 621, 621A

## Radio Receivers



## Specifications

### Frequency Range:

Broadcast, White—528 to 1730 K.C.  
Short Wave, Green—5.7 to 10.2 megacycles  
Short Wave, Red—11.5 to 15.6 megacycles

### Tubes:

Type	Function
6A8G	Converter
6K7	I.F. Amplifier
6H6	2nd Detector
6F5	1st A.F. Amplifier
6V6G	Output Amplifier
5Y4G	Rectifier

### Power Supply:

Models 620, 621: 105 to 125 volts A.C.,  
60 cycles.  
Models 620A, 621A: 105 to 125 volts A.C.,  
25-60 cycles.

### A.V.C.:

Applied to 6K7, I.F. Amplifier, and 6A8G Converter.

### Radio-Phono:

Item 72 is a phonograph connection strip. A high impedance pick-up may be connected to shorting bar and left hand terminal as shown in schematic.

### Controls:

Left to Right—A.C. switch; volume control; tuning control; wave change switch; tone control.

### Loudspeakers:

Models 620, 620A—eight inch electro-dynamic.  
Models 621, 621A—Twelve inch electro-dynamic.

### Cabinets:

Models 620, 620A—Table model  
Models 621, 621A—Console model

**GENERAL:**—These are a-c operated radio receivers of the superheterodyne type, and employ six tubes. The Model 620 is enclosed in a table model cabinet, with the speaker to one side of the chassis. The Model 621 is the console. The former uses an eight-inch, and the latter a twelve-inch, electrodynamic loudspeaker. The dial is of the oval airplane type and uses an edge-lighted glass scale calibrated in kilocycles on the broadcast band and megacycles on the short-wave bands. A tuning lamp and wave change indicator are incorporated in the dial.

The tuning ranges are:—

- Broadcast [White]—528 to 1730 kilocycles.
- Short-Wave [Green]—5.7 to 10.2 megacycles.
- Short-Wave [Red]—11.5 to 15.6 megacycles.

A vernier tuning drive is used and electrical band-spread is employed on the two-short-wave bands.

The a-c load rating at 115 volts line is 62 watts for both the 25 and 60 cycle models. Models 620 and 621 are for use on 60-cycle supplies and Models 620-A and 621-A on supplies from 25 to 60 cycles.

**CIRCUIT:**—The broadcast antenna transformer uses both inductive coupling between primary and secondary, items 2 and 3, and capacitive coupling through item 4. Item 1 by-passes short-wave signals around the broadcast antenna transformer primary. Tuning capacitor section item 6 is used with the broadcast antenna transformer only and is unswitched. Item 20 switches the short-wave antenna transformer secondaries and the broadcast preselector, item 15. Items 7 and 8 are the antenna and oscillator sections respectively of the tuning capacitor. In the short-wave positions the switch sections 21 and 24 insert small capacitors in series with the main tuning capacitors, thus decreasing their effective capacity and giving electrical band-spread on the short-wave bands. Switch sections, items 22 and 23, switch the plate and grid windings, respectively of the oscillator coils, and section item 25 shorts out the grid winding of the oscillator coil next lower in frequency than the one in use.

Item 35 is a by-pass capacitor which also provides coupling on the broadcast oscillator coil. Item 100 is an electrolytic capacitor filtering the oscillator plate supply.

The type 6A8G converter is coupled to the 6K7 by the permeability tuned I.F. transformer, item 49, and the 6K7 is in turn similarly coupled to the second detector, a type 6H6.

Item 75 is the volume control which acts as both audio and a.v.c. load. Item 72 is the phonograph connection strip. With the shorting bar in the position shown the receiver functions normally; when the bar is changed to connect the centre and right terminals (marked "P" on the schematic) the audio load of the diode is shorted and no radio signals will be received. A high impedance pick-up may now be connected to this shorting bar and the left hand terminal, with which connection the audio amplifier will operate as a phonograph amplifier.

The type 6F5 audio amplifier is resistance-capacitance coupled both on its input and output and feeds the type 6V6G output amplifier.

Items 85 and 86 constitute a tone control of the constant impedance type.

The speaker coupling circuits and power circuits are conventional.

Item 73 is the tuning lamp, which carries the plate current of the two tubes under control of the a.v.c. When a strong signal is tuned the a.v.c. increases the bias of these tubes, their current decreases and the lamp dims.

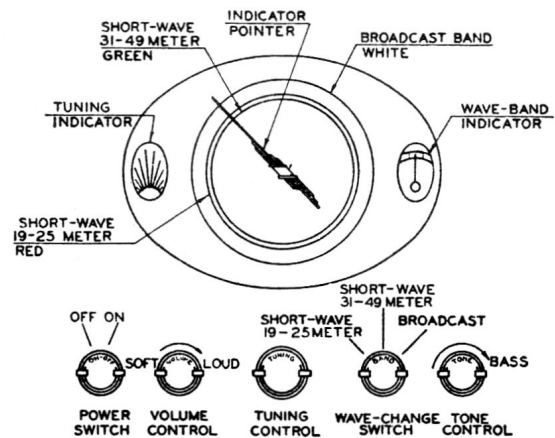
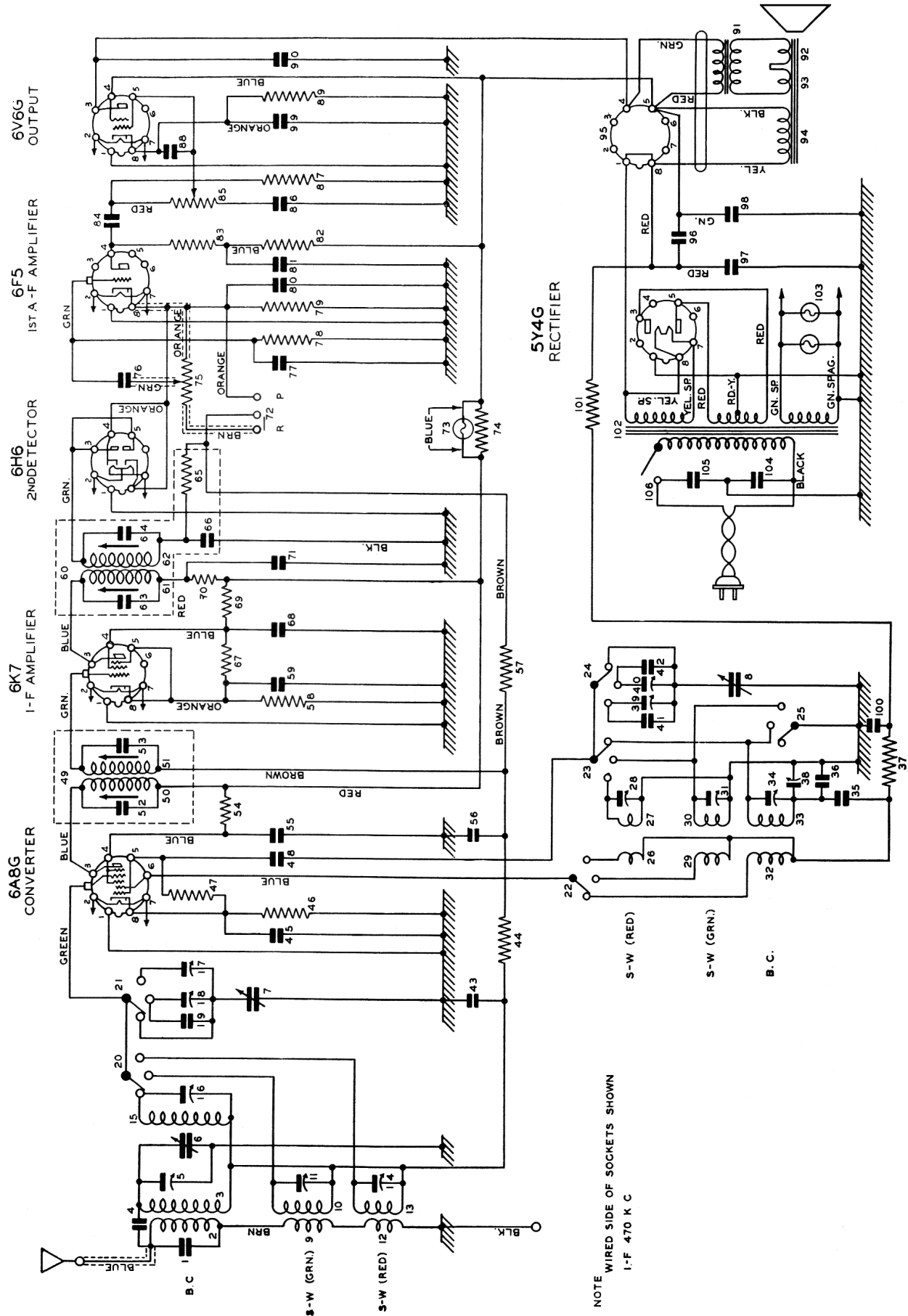


Figure 1.—Model 620-621—Control Positions.

# MODELS 620-621 RADIO RECEIVERS



Schematic Diagram—Model 620-621 Receiver.

# REPLACEMENT PARTS LIST

Schematic Designation	Value and Description	Part Number
1	Capacitor, mica, 100 mmf. . .	K-1611-2
2	Bdcst. Ant. Trans. Prim. . . . .	K-3020
3	Bdcst. Ant. Trans. Sec. . . . .	
4	Capacitor, Coupling, 4 mmf. .	K-3022
5	Trimmer, Bdsct. Ant. . . . .	
6	Tuning, Bdcst. Ant. Sec. . . . .	
7	Tuning, Ant. (main) . . . . .	
8	Oscillator . . . . .	K-3001
9	Green Ant. Trans. Pri. . . . .	
10	Green Ant. Trans. Sec. . . . .	K-1458-6
11	Capacitor Trim, 3-25 mmf. . .	
12	Red. Ant. Trans. Pri. . . . .	K-3017
13	Red. Ant. Trans. Sec. . . . .	
14	Capacitor, Trim, 3-25 mmf. .	K-1458-6
15	Bdct. Preslector Coil . . . . .	K-2980
16	Capacitor, trim, 1.5-10 mmf. .	K-1458-5
17	Capacitor, Trim, 26-120 mmf. .	K-3036
18	Capacitor, Trim, 26-120 mmf. .	
19	Capacitor, Mica, 100 mmf, plus or minus 3% . . . . .	K-1611-25
20	W.C. Switch, Ant. Trans. Sect. . . . .	K-3027
21	W.C. Switch, Ant. Gang. Sect. . . . .	
22	W.S. Switch, Osc. Plate Sect. .	
23	W.S. Switch, Osc. Grid. Sect. .	
24	W.C. Switch, Osc. Gang Sect. .	K-3016
25	W.C. Switch, Osc. Shorting	
26	Red. Osc. Trans. Pri. . . . .	K-3016
27	Red. Osc. Trans. Sec. . . . .	
28	Capacitor, Trim, 3-25 mmf. .	K-1458-6
29	Green Osc. Trans. Pri. . . . .	K-3002
30	Green Osc. Trans. Sec. . . . .	
31	Capacitor, Trim, 1.5-10 mmf .	K-1458-5
32	Bdct. Osc. Trans. Pri. . . . .	K-3021
33	Bdct. Osc. Trans. Sec. . . . .	
34	Capacitor, Trim, 3-25 mmf. .	K-1458-5
35	Capacitor, .001 mf, 350 volts	K-2228-1
36	Capacitor, Mica, 340 mmf, plus or minus 3% . . . . .	K-1611-26
37	Resistor, 10,000 ohms . . . . .	K-2226-10
38	Capacitor, Trim, 26-120 mmf. .	K-3037
39	Capacitor, Trim, 26-120 mmf. .	
40	Capacitor, Trim, 26-120 mmf. .	K-1611-29
41	Capacitor, Mica, 20 mmf, plus or minus 3% . . . . .	
42	Capacitor, Mica, 100 mmf, plus or minus 3% . . . . .	K-1611-25
43	Capacitor, .05 mf, 175 volts .	K-2227-8
44	Resistor, 1/10 meg . . . . .	K-2226-5
45	Capacitor, .05 mf, 175 volts .	K-2227-8
46	Resistor, 450 ohms . . . . .	K-2226-43
47	Resistor, 50,000 ohms . . . . .	K-2226-6

Schematic Designation	Value and Description	Part Number
48	Capacitor, Mica, 100 mmf. . .	K-1611-2
49	1st I.F. Trans. Assem. . . . .	K-2996
50	1st I.F. Trans. Pri. . . . .	
51	1st I.F. Trans. Sec. . . . .	
52	Mica Capacitor { not replace-	
53	Mica Capacitor { able	K-2226-6
54	Resistor, 50,000 ohms . . . . .	
55	Capacitor, 0.1 mfd, 350 volts	K-2228-9
56	Capacitor, 0.05 mfd, 175 volts	K-2227-8
57	Resistor, 2 meg . . . . .	K-2226-1
58	Resistor, 220 ohms . . . . .	K-2226-45
59	Capacitor, 0.05 mf, 175 volts.	K-2227-8
60	2nd I.F. Trans. Assem. . . . .	K-2999
61	2nd I.F. Trans. Pri. . . . .	
62	2nd I.F. Trans. Sec. . . . .	
63	Mica Capacitor { not re-	
64	Mica Capacitor { placeable}	K-2226-2
65	Resistor, 50,000 ohms—	
66	Capacitor, Mica, 100 mmf—	K-1611-2
67	Resistor, 8,800 ohms . . . . .	K-2363-42
68	Capacitor, 0.1 mf, 175 volts.	K-2227-9
69	Resistor, 6,600 ohms . . . . .	K-2363-41
70	Resistor, 1,000 ohms . . . . .	K-2226-16
71	Capacitor, .05 mf, 350 volts. .	K-2228-8
72	Phonograph Connections . . . .	—
73	Tuning Lamp, 24 volt. . . . .	K-2643
74	Resistor, 10,000 ohms . . . . .	K-2363-21
75	Volume Control, 1/2 meg. . . .	K-3024
76	Capacitor, .005 mf, 175 volts	K-2227-4
77	Capacitor, Mica, 100 mmf. . .	K-1611-2
78	Resistor, 2 meg . . . . .	K-2226-1
69	Resistor, 4,000 ohms . . . . .	K-2226-28
80	Capacitor, 0.5 mf, 175 volts.	K-2227-8
81	Capacitor, 0.1 mf, 350 volts.	K-2228-9
82	Resistor, 1/10 meg . . . . .	K-2226-5
83	Resistor, 1/4 meg . . . . .	K-2226-4
84	Capacitor, .005 mf, 350 volts	K-2228-5
85	Tone Control, 1/4 meg . . . . .	K-3025
86	Capacitor, .002 mf, 175 volts	K-2227-1
87	Resistor, 1/4 meg . . . . .	K-2226-4
88	Capacitor, mica, 100 mmf. . .	K-1611-2
89	Resistor, 300 ohms . . . . .	K-2226-20
90	Capacitor, .003 mf, 350 volts	K-2228-3
91	Output Transformer—Model 620 . . . . .	K-2718-5
91a	Output Transformer—Model 621 . . . . .	K-2718-6
92	Diaphragm & Voice Coil (1.82 ohms)—Model 620. .	K-2544
92a	Diaphragm & Voice Coil (1.82 ohms)—Model 621. .	K-3043
93	Humbucking Coil . . . . .	—
94	Field Coil—1,400 ohms . . . .	K-2543-4
95	Loudspeaker Socket . . . . .	—
96	Capacitor, 0.05 mf, 175 volts	K-2227-8

# REALIGNING INSTRUCTIONS

## I.F. ALIGNMENT—(See Figure 2)

- (a) Set the signal generator at 470 k.c. and connect its output through a 0.1 mf. capacitor to the grid cap of the first detector (type 6A8G) tube. Set the receiver dial to about 600 k.c. and turn the wave-change switch to the broadcast position.
- (b) Adjust screws 50, 51, 61, 62 (movable cores, as shown on the schematic) for maximum output.
- (c) Reduce the output from the generator to as low a value as will give an output reading and check the adjustments, all of which should peak properly.

## R.F. ALIGNMENT—(See Figure 3—Underside Aligning Positions). Broadcast Band:—

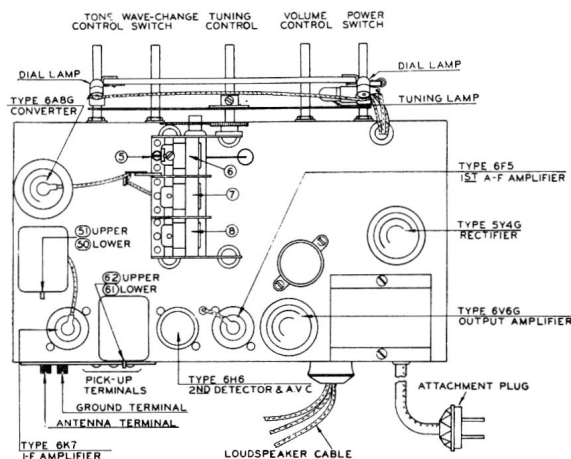
- (a) With the gang all in check the position of the pointer. It should line up with the end of the scale. Put 100 mmf. dummy antenna in generator lead and set wave-change switch to broadcast position.
- (b) Set generator and receiver to 1500 k.c. Adjust 34 to tune in the signal, and adjust 5 and 16 for maximum output.
- (c) Set the generator to 600 k.c. and tune in the signal. Adjust 38 for maximum output while rocking the gang. Recheck at 1500 k.c.

## GREEN BAND:—

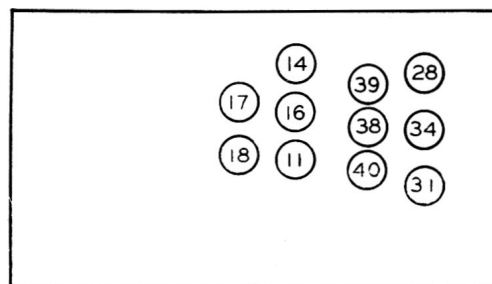
- (a) Substitute a 400 ohm carbon resistor in place of the capacitor in the lead from the signal generator. Turn the wave-change switch to the green band position.
- (b) Set the receiver and generator to 9.5 megacycles. Adjust 31 to tune in the signal and adjust 11 for maximum output, while rocking the gang. (Note—check for image at 8.6 megacycles.)
- (c) Set the receiver and generator to 6 megacycles and adjust 40 to tune in the signal. Adjust 18 for maximum output. (Check for image at 5.1 mc.) It will be necessary to repeat the above operations several times in order to obtain correct calibration at both ends of the band.

## RED BAND:—

- (a) Use a 400 ohm carbon resistor in the lead from the generator to the receiver. Turn the wave change switch to the red band position.
- (b) Set the generator and receiver to 15 megacycles. Adjust 28 to tune in the signal and adjust 14 for maximum output while rocking the gang. (Check for the image at 15.9 mc.)
- (c) Set the generator and pointer to 11.6 mc. and adjust 39 to tune in the signal. Adjust 17 for maximum output while rocking the gang. (Check for image at 12.7 mc.) Recheck at 15 mc. It will be necessary to repeat the above operations several times in order to obtain correct calibration at both ends of the band.



Model 620-621—Chassis Layout Showing Upper Aligning Points and Tube Positions.



LOOKING AT BOTTOM OF CHASSIS FROM THE BACK

Underside Aligning Positions.

# REPLACEMENT PARTS LIST—Continued

Schematic Designation	Value and Description	Part Number
97	Capacitor, Elec., 8 mfd, 400 volts.....	K-3023
98	Capacitor, Elec, 8 mfd, 300 volts.....	
99	Capacitor, Elec, 10 mfd, 15 volts.....	
100	Capacitor, Elec, 4 mfd, 250 volts.....	
101	Resistor, 30,000 ohms.....	K-2363-3
102	Power Transformer—60 cycles	K-2179-16
102a	Power Transformer—25 cycles	K-2179-17
103	Dial Lamp.....	K-2589-3
104	Capacitor, 0.025 mf, A.C. Line.....	K-1750
105	Capacitor, 0.025 mf, A.C. Line.....	
106	A.C. Switch.....	K-3028

## MISCELLANEOUS:—

Octal Base Sockets.....	K-1924-1
Tube Shield Base.....	K-2390-2
Antenna and Pick-Up Strip.....	K-2986
Insulation Plate.....	K-2594
Wave Change Indicator.....	K-3142
Tuning Indicator.....	K-2654
Fibre Drive Disc.....	K-3959
Reduction Drive.....	K-3082
Dial Scale (glass) & Facing (gold)	K-3535
Tuning Meter Scale.....	K-3065

Schematic Designation	Value and Description	Part Number
	Drive Cord (18" long).....	K-1929
	Insulator Shell for T.L. Socket....	K-3124
	Tuning Lamp Socket.....	K-3123
	Dial Lamp Socket.....	K-2835
	Dial Mounting Spacer (1 $\frac{1}{8}$ ")....	K-2931-9
	Dial Lamps.....	K-2589-3
	Cover for A.C. Switch.....	K-3143
	Insulation Strip.....	K-2505
	L.S. Mounting Screw (Flower head 8/32 x 1 $\frac{1}{4}$ ").....	K-2971-2
	Tube Shield.....	K-2267-2
	Grid Clips.....	K-1821
	Chassis Mounting Screws (620-621)	K-1122-10
	Escutcheon Mounting Screw (No. 2 x $\frac{3}{8}$ ").....	K-3081-3
	Back Screen—Model 620.....	K-3051
	Back Screen—Model 621.....	K-3052
	Knob—"Tuning".....	K-2885-2
	Knob—"Volume".....	K-2765-3
	Knob—"On-Off".....	K-2765-7
	Knob—"Tone".....	K-2765-8
	Knob—"Band".....	K-2765-9
	Felt Washers for Knobs.....	K-2491-4
	Escutcheon Pins.....	K-3116
	Escutcheon Assembly.....	K-3072
	Dial Scale Cover.....	K-2897
	Dial Scale Clips.....	K-2436
	Tuning Wrenches (all models)....	K-836



## SOCKET VOLTAGE READINGS

TUBE	VOLTAGES				CURRENTS—M.A.		
					Screen	PLATE	
	Heater a-c.	Plate	Screen	Cathode		Normal Bias	Bias red. 4½ volts
Type 6A8G	6.25	210①	87	3.5	2.5	2.2②	4.5
Type 6K7	6.25	200	115	4.5	1.6	6.6	10.0
Type 6H6	6.25	..	..	1.0	..	..	..
Type 6F5	6.25	66	..	1.0	..	0.33	0.46
Type 6V6G	6.25	205	220	10.0	3.25	3.30	39.0
Type 5Y4G	4.9	..	..	310	..	..	..

① Anode-grid voltage—148.

② Anode-grid current—3.7 m.a.

## SOCKET RESISTANCE READINGS TO GROUND — OHMS

TUBE	Top Cap Cont. Grid	Pin No. 1 Shell	Pin No. 2 Heater	Pin No. 3 Plate	Pin No. 4 Screen	Pin No. 5	Pin No. 6	Pin No. 7 Heater	Pin No. 8 Cathode
Type 6A8G Converter	2.6 meg.	0	0.3	15600	65600	(Grid No. 1) 50450	(Grid No. 2) 57720	0	450
Type 6K7 I.F. Amplifier	2.5 meg.	0	0.3	16600	9020	(Sup- pressor) 220	..	0	220
Type 6H6 2nd Detector	..	0	0.3	554000	(Cathode) 4000	(Plate) 554000	..	0	4000
Type 6F5 1st A-F Amplifier	2.0 meg.	0	0.3	..	(Plate) 366300	..	..	0	4000
Type 6V6G Output Amplifier	..	0	0.3	16800	16300	(Grid) 250000	..	0	300
Type 5Y4G Rectifier	..	0	..	(Plate) 175–60 cyc. 300–25 cyc.	..	(Plate) 175–60 cyc. 300–25 cyc.	..	(Heater) 17700	(Heater) 17700

All readings are taken with the power off, volume control maximum and tone control in treble position. The pin numbers correspond with those shown on the schematic circuit.